

C-A OPERATIONS PROCEDURES MANUAL

Text Pages 2 through 4

<u>HPC No.</u>	<u>Date</u>	<u>Page Nos.</u>	<u>Initials</u>
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13.8.2 Calibration

1. Purpose

To define a calibration program for the Collider-Accelerator Department (C-A), which supplements the BNL's Standards Based Management System (SBMS) Calibration subject area. This program applies to the calibration and maintenance of Measurement & Test Equipment (M&TE) that are to be used to verify conformance to prescribed high accuracy technical requirements during inspection, testing and research.

Note:

This procedure does not apply to unique research apparatus/equipment intrinsic to an experiment, which is set up and calibrated by researchers using procedures or processes accepted by the appropriate scientific community.

2. Responsibilities

2.1 The Project Engineer or Liaison Engineer is responsible for determining whether calibration is required when a piece of equipment is used in any of the following activities:

- Inspections;
- Acceptance testing;
- Data collection;
- Process monitoring;
- Maintenance, repair, and calibration of installed facility equipment and instruments.

2.2 C-A personnel are required to employ calibrated equipment when specified in operations, maintenance or ES&H procedures.

3. Prerequisites

None

4. Precautions

None

5. Procedure

5.1 By applying the graded approach, the most emphasis is placed on those items that may have the greatest effect upon personnel, environment, safety, health, cost, data quality, equipment, performance, and schedule.

- 5.1.1 In most cases, category A1 or A2 equipment/instruments shall be calibrated. When a decision is made to not calibrate category A1 or A2 equipment/instruments, the responsible individual must obtain documented approval from line management.
- 5.1.2 The decision to calibrate category A3 or A4 equipment/instruments is at the discretion of the responsible individual, as is the documentation of a decision not to calibrate.
- 5.1.3 Calibration may also be required by the contract, client/sponsor, or management.
- 5.2 Equipment should be calibrated if:
 - 5.2.1 Equipment performance can affect the product or quality of results in ways not detectable with other calibrated instruments and procedures.
 - 5.2.2 If data produced by the equipment is compromised, not retrievable or not repeatable, project and/or operations costs are raised unacceptably.
- 5.3 Monitoring equipment that meets the following criteria need not be calibrated.
 - 5.3.1 Adequate level of designed redundancy in the monitoring/testing performed, e.g., amount of make-up water measured with two different flow meters.
 - 5.3.2 Different equipment/processes/protocols used to perform or derive monitoring/testing results within the system, i.e. same measurement made using different equipment/process/protocol. For example, monitoring of the level in a tank performed by both mechanical and electronic gauges.
- 5.4 Labeling
 - 5.4.1 M&TE used for acceptance purposes, or where critical measurements are to be made, shall be labeled such that potential users of the equipment are aware of its calibration status, e.g. "Calibrate Before Each Use", "Calibration Due".
 - 5.4.2 Equipment not used for inspection, acceptance or critical measurements, do not require labels or inclusion in the calibration system. It is at the discretion of the Project Engineer or Liaison Engineer to require that equipment not in the calibration system be identified (e.g. "Not In Calibration System").
- 5.5 Procedures
 - 5.5.1 Existing procedures, e.g. published standard, manufacture's or instructions established by other BNL divisions, should be used whenever possible.

5.5.2 Procedures for calibrating special or in-house built equipment, shall be developed by the Project Engineer, Liaison Engineer, or designee, and be approved by the appropriate personnel.

5.5.3 For calibrations performed by an outside source, procedures need not be prepared by C-A, a report/certificate shall be obtained as the record of calibration. The BNL Quality Program and Services Office shall be notified of off-site facilities performing calibrations for C-A.

5.6 M&TE found to be out of calibration or damaged shall be handled in accordance with the [SBMS Calibration](#) subject area.

6. Documentation

Records shall comply, as appropriate, with the SBMS Calibration Subject Area, and unless otherwise specified, be maintained for a minimum of three (3) years.

7. References

7.1 [SBMS, Calibration](#)

7.2 [SBMS, Nonconformance and Corrective and Preventive Action](#)

8. Attachments

None